Notebook Series -- Notebooks by Experimenters Other Than Edison
Kinetophone and Kinetoscope Experiments -- A. M. Kennedy Books
Notebook, N-13-04-20

This notebook was used by Absalom M. Kennedy in April 1913 as a record of experimental work on the kinetophone. Included is a description of the making of three complete kinetophone recording outfits—one for Europe, another for the laboratory, and a third for reserve. The entries provide extensive details about each outfit, including camera, synchronizer, storage batteries, recording machine, amplifying machine, shaving machine, and blanks. They also describe adjustments made on the basis of recommendations or testing. Some final entries contain data regarding tests of business phonographs and motors. Also included are entries pertaining to meetings of the "kinetophone experimenters" and the tasks assigned to them. The notes indicate that Adolph F. Gall and George J. Werner were also doing kinetophone-related work and were consulted by Kennedy. There are tabs cut into the pages labeled "Camera," "Recorder," "Amplifier," "Shaver," and "Miscellaneous." The front cover and spine are each labeled "Kinetophone Studio Outfits." The pages are unnumbered. Approximately 50 pages have been used.

Acme Co.,
MFG. STATIONERS,
96 JOHN ST
AND
19 PLATT ST.
NEW YORK.
54472

A.M. Kennedy
Laboratory

Initial
Gaston
Henderson

4/20/13.

MAKING 3 COMPLETE KIENETOPHONE

RECORDING OUTFITS.

Three outfits complete to be made for: in order of importance:

1. Europe
2. Laboratory
3. Reserve

The first and third to consist of:

(1) 1. Converted Pathe Camera
a - to take 400 ft reterts
b - to have 2" focus VOIGHTLANDER lens such as now used at Bronx (Physioc. has data on this lens)
c - Registering device to show amount of film exposed.
d - 6 spare reterts to take 400 ft.
Note - The camera is to be mounted on a table made for the purpose.

2. One synchronizing drive for camera housing:
   a- Low voltage motor to operate from storage battery.
   b- Carbon pile rheostat for motor speed control.
   c- Counter shaft, chain drive and balance wheel.

3. One table for camera and synchronizer drive.

4. (2) Set of storage batteries for operating camera etc.

5. One recording machine complete, spring drive, and housing:
   a- One dozen recordings complete.
   b- Two dozen recording styluses: (.038" diameter, cupped with .135" lap)
   .125" c- 2 extra feed screws (?) feed nuts.
   d- Recording Horn
   e- Recording Machine Pedestal
   f- Synchronizer cord tightener and pedestal.

6. One amplifying machine having:
a- Low voltage motor to run from same storage battery.
b- Carbon pile rheostat for same
c- 8 spare needle arms.
10 ry. d- 6 recording sapphires .024" diameter, cupped with .075" lap.
e- 3 reproducer ball sapphires .037" diameter.
1 doz. f- 2 spare feed nuts (long flat screws)
g- protective case for device.

7 Shaving machine having:
a- ¼ H.P. motor drive for same storage battery.
b- 12 shaving knives.
c- 6 spare feed nuts.
d- 1 " feed screw
e- 6 extra front centers
f- 6 " rear centers
g- 1 suction blower of ample size to care for recording, amplifying and shaving machines.

8. Blanks as follows:
a- 50 blanks for recording.
b- 200 special cans for transporting blanks, to be hermetically sealed.

9. 1 Kinetophone complete with sapphire ball on reproducer and:
a- Three extra sapphire lenses and jewels.
b- all repair parts as at present included in sets
c- telephone outfit.

(10) Added by Committee
1 microscope with light and mandrel for examining wax masters.

Laboratory Outfit should consist of:

1 - Camera
b - same as studio
c - " " "
d - 2 spare retorts, 400 ft.

2 - Complete

3 - Complete

4 - Not necessary. Can find.

5 - Recording machine with:
a - three extra recorders.
b - 1/2 doz. recording styluses as studio equipment.

6 - Amplifying Machine with
a - as studio equipment
b - " " "
c - " " "
d - only 2 sapphires
e " 1 hard sapphire -

7. - Shaving Machine and
a - 110 volt D.C. Motor - 1/8 H.P.
b. 2 knives
c. 2 spare nuts
d - 1 screw
e - 2 front centers
f - 2 rear centers
g - same as studio equipment.

8 - Will get blanks as need them.

9 - Have same

The duplicate equipment for the Bronx studio should be the same as the European outfit.

4/21/13

Meeting of Kinetophone Experimenters.
(See record of meeting).

"K. x Norton instructed to prepare a multi-phase (synchronous) motor driven recording phonograph and motion picture camera as early as practicable and subject same to rigid tests."

Gears to be substituted for chain on recording, amplifying and shaving machines.
(Gall volunteered to do this)

Combined helical gear and belt & pulley drive for amplifying machine.
(Gall instructed to do this)

On account of expansion of mandrels and shafts expanding spring centers instituted in place of solid. (Gall volunteered to attend to it)

Electrically heated box with thermostat control to heat wax cylinders in cans to temperature of room.
(K. to design)

Flat springs on small end of mandrel of all recording machines, nickelled, not buffed.
(K. to design)

Mandrels capable of sliding on shafts to get alignment by splint taper bearings & nuts. Amplifier only.
(Gale to design)

Feed nuts & springs to be twin. That on amplifier to have release knob.
(K. to look after. Gale volunteered on latter)

Stud adjusting screw to be changed.
(Gale volunteered to do)

Top plate of recording machine to be fastened to top of box & hinged
(K to look after)

Recording machines to be provided with lead fly wheel.
(K to look after)

Method of raising recording arm by lever in place of sliding pin on recording machine.
(K to look after)

Feed nut spring screw holes slotted for adjustment.
(K to look after)

Pedestal for recording machine to be designed.
(Gail instructed. Transferred to K.)

All machines to be provided with suction tubes for removing chips.
(K to look after)

Phone conversation with Mr. Leeming developed that European equipment is to be portable. This must be taken into consideration on design-

Changes made from Original Design.

(1) It was found that variation in speed was caused by the feed nut on shaft pivot bearing rubbing against the gear. This was changed.

(2) The machine was very bluety This seems to have been caused by the friction roll running too slow. Pulleys were changed so that the friction rolls speed was increased and much better tone was obtained.

At meeting of the Kinetophone Experimenters Committee of 5/22/13, it was recommended that a new governor be used - that a fly wheel be put on the mandrel shaft and that the idler on friction roll drive belt be put on other or loose side.

Mark on machine developed that:

Governor worm drive gear weak and buckled under strain.

Rackets show wear.

Small amount of dirt in bearings makes quite difference in regulation, running and starting of machine.

4/23/13.

Mr. Werner reports that on account of static electricity he has had to modify the Pathe Cameras he has used and:

(1) Change hard rubber rollers on retorts for metal and remove velvet. He arranges also a slide over the retort outlet to prevent light from getting in when door is opened. This slide is operated by external lever.

(2) Velvet removed from film guide and metal rollers substituted.

(3) Ribbon removed from back of aperture cover and aluminum of this smoothed thoroughly.

He reports also that that the Pathe Camera possesses the following additional disadvantages:

(1) Extremely difficult to focus as door is on side farthest away from aperture.

(2) Two retorts used which hold only 200 ft of film each.

(3) Unwieldy in size - both

CAMERA

wider and higher than necessary due to double retorts and spare retorts being kept in camera case.

Be that 2" Voightlander lens

4/25/13

Present Lens to Voightlander Telear to fit Pathe Motion Picture Camera, 2" focus.

Reported that the mounts of present Pathe cameras have been changed and the above Voightlander lens was for old mount.

Camera should be provided with Veeder Cyclometers which will record each foot of film used. This may be placed on the crank or driving shaft.

Camera drive at Bronx Studio is as follows:
Close to camera is fastened a pair of gears driving a Veeder Cyclometer

which, Higham reports, records film used in 6" intervals. Further out is a sprocket and to this is affixed one portion of a unusual joint consisting of a shouldered disc with two pins. These pins engage in two of four slots of a loose washer; in the other two slots of which are two pins of a similar shouldered disc which is fastened to an independant shaft which with appropriate bearings carries a 7" fly wheel weighing apparently about 6#. Next to the fly wheel is a pulley with v grove for round belt which is belted to an Emerson Type 412 E.A. Speed 1800 - H.P. 1/16 - 110 V. .9 amp #893457 D.C. motor. An extension of the fly wheel shaft carries a slot arranged to fit the crank of Pathe Camera for hand drive.

The sprocket is connected by chain to the sprocket of synchronizer by a chain. The ratio of gearing of these two sprockets are apparently

about 2 to 1.

The motor is about 4 ft from the camera.

Dugham says that a series motor would do as well or better. The object desired here is to keep the motor loaded so that it pulls steadily against the brake of the synchronizer.

The camera is fastened to table by castings through which are carried ½" rods with wing nuts.

4/26/13.
Order placed with Mr. Mudd for 3 camera cases as per Works drawings 4/23/13.

Order placed with Mr. Mudd for 12 extra retorts for same 4/26/13

Present machine to be used and modified as follows:

1. Chain drive for feed screw to be changed to gear drive.
2. Fixed centers on mandrel to be replaced by spring centers.
3. Aluminum mandrel to be changed to brass mandrel and springs put on small end.
4. Single feed nuts to be changed to twin nuts & springs with slotted screw holes so as to be adjustable.
5. Speed adjusting knob to have slotted head and not project above bed plate. Should have clamping arrangement to prevent turning too freely.
6. Bed plate to be made fast to top of case and top of case hinged and provided with hold up device.
7. Suction tube similar to one on shaving machine to be provided and attached.

RECORDER

(8) Lever lift for raising recording arm in place of sliding pin as at present.

4/25/13.

Mr. Marrow has suggested that the recording arm of the recorder be mounted so as to slide on the present guide and that this sliding be regulated by a screw. That a microscope or other finder be located on this arm. The purpose of this will be to locate the thread that cut or point from which the recorder was raised accurately if necessary to have a break in the record.

He also suggests a hook on which to hang the end of the loop of cord holding up the recorder when same is not in use.

1/26/13.
Order placed with Mr. Rico for 6 mandrels to be cast of Brackett metal in place of McAdamite for trial.

A small blower such as used in business phonograph shavers, enclosed in a box to prevent noise may perhaps be used to take dust away from recorder

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Mapleson
Turner

Present machine to be used modified as follows:

1. Chain drive to feed nut to be changed to gear drive.
2. Combined helical gear and nut drive with belt pulleys of slightly different diameters to be used for synchronous driving of the two mandrels.
3. Mandrels provided with split bearings & taper nuts so as to be adjustable on shaft with respect to each other.
4. Feed nuts and springs to be twin. Knob on feed nut springs to release readily. Feed nut spring to have slotted screw holes for adjustment.
5. Suction tubes for removing chips to be provided.
6. Mandrels to be given thin coating of nickel.

AMPLIFIER

4/25/13.

Speed of amplifier should be from 120 to 80 R.P.M. Should be designed to vary this much by having regular spring governor on motor shaft, with countershaft to reduce the speed.

Forms for this work should be Triumph with extension tube.

Present machine to be used, modified as follows:

① Chain drive for feed screw to be replaced by gear drive.

② Twin feed nuts & springs with slotted screw holes to be used.

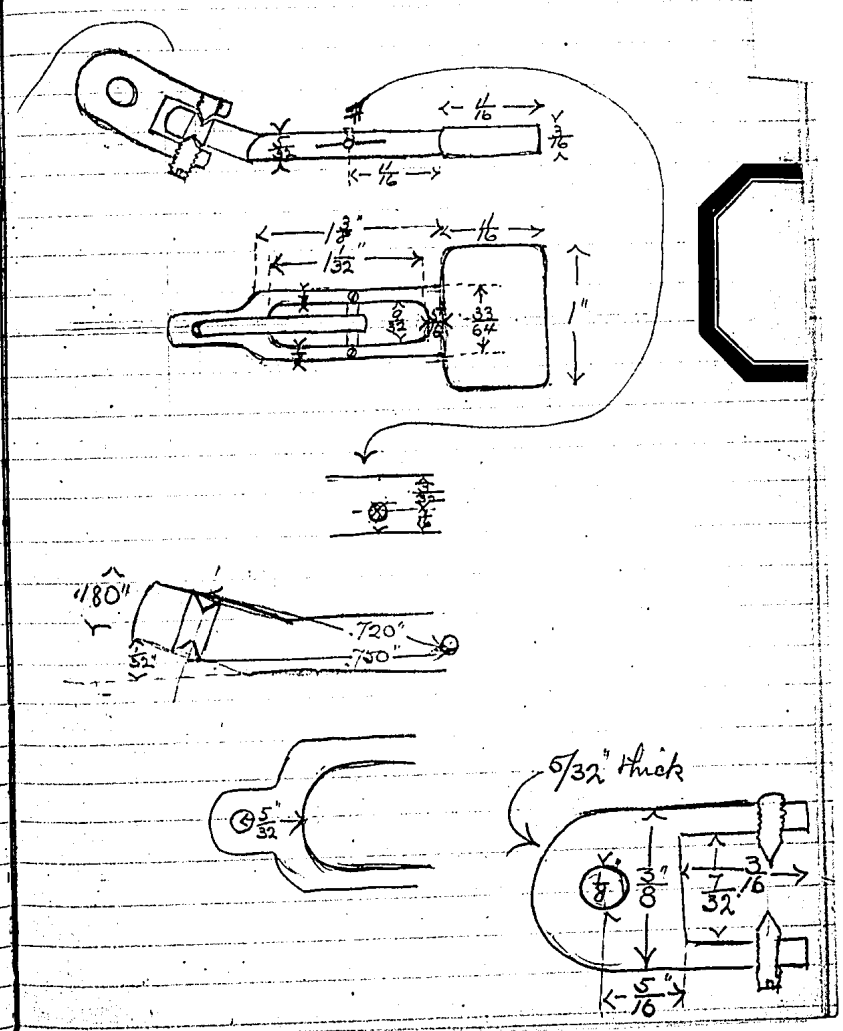
③ Brass mandrel, with light plating of nickel, not burnished to be used.

SHAVER

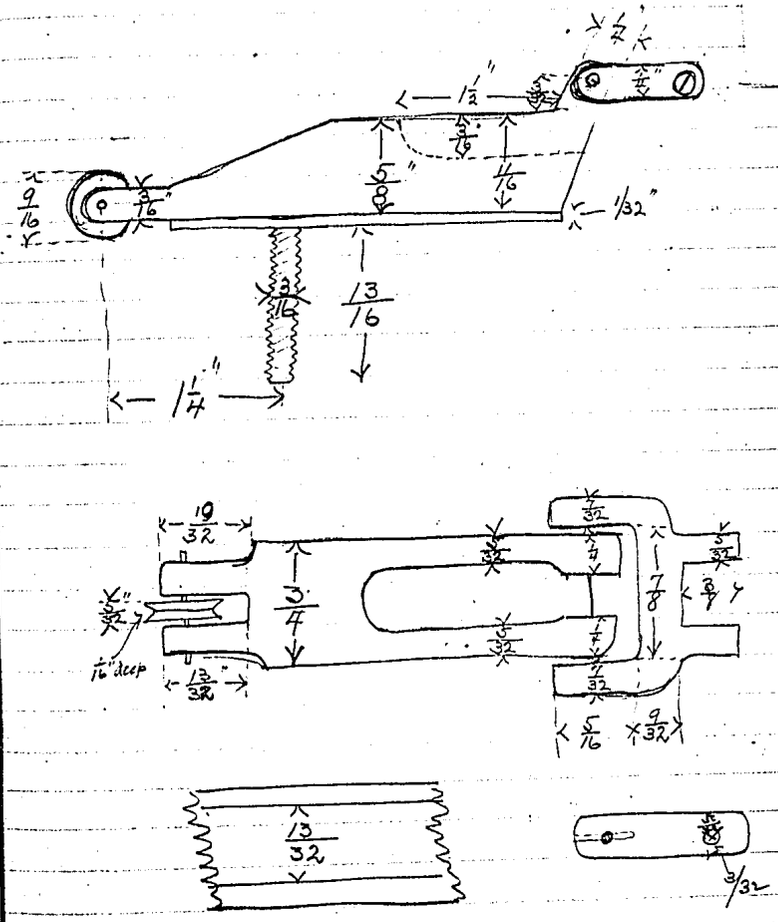
Gage reports 1/20 H.P. for shaving machine needed.

Shaving machine runs in wal department at about 700 R.P.M.

Amplifier Lever Arm.

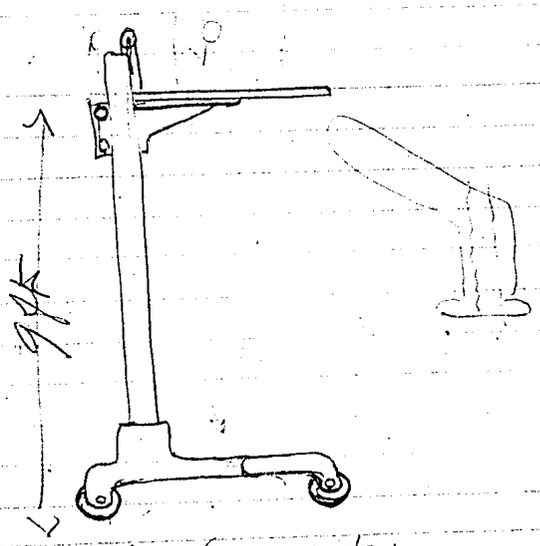


Amplifier Lever Arm Holder.



Design pedestal for recording machine, drum and synchronizer.

Get suction blower to carry max chips from the three machines.



Design for pedestal by Gall.

MISCELLANEOUS

Essner - to make amplifying arms
Smith - Draftsman

4/25/13.

The Recorder Pedestal should be able to raise the recording phonograph 8 to 9 feet from the floor.

The suction blower should have a direct connected motor of sufficient size to give sufficient suction.

A Microscope adapted to examine master records should be furnished with each equipment.

Test of Business Phonograph
D.C. Motor - Old Style.

Speed	Amps.	Volts
1500	.7	30
1250	.76	29.75
1000	.82	29.4
800	.87	29
600	.92	28.6
500	.97	28.4
400	1.00	28.2
300	1.01	27.9 from field
800	.89	29.5
600	.94	29.3
500	.98	29.2
400	1.00	29.
300	1.01	28.8
250	1.03	28.7
200	1.05	28.1
150	1.05	28.5
100	1.06	28.3
0	1.1	28.25

Test of Business Phonograph,
D.C. Motor - Old Style.

Speed	Amps.	Watts.
1500	.55	25.25
1250	.6	25.
1000	.7	25.
800	.75	25.
700	.8	25
600	.8	25.
500	.85	25.
400	.89	25.
300	.9	25.
200	.94	25.
150	.96	25.
100	.98	25.
0	1.00	25

Motors:

T.A.E. Inc. - Elect. Dept. make two styles of motors.

50 H.P. - Shunt or series wound for any voltage D.C.

50 H.P. Series wound to 30 volts D.C.

The latter has extension shaft with spring governor mounted on for House Lighting Regulator.

Test of T.A.E. Inc: House Lighting Controller Motor with Business Phonograph Blower.

No Cells	Volts	Amps.	Speed of Blower	Speed of Motor
15	17.5	.3	750	310
20	24.25	.35	1600	675
25	30.6	.35	2500	1000
30	34.75	.4	3000	1140
35	39.	.41	3400	1300
40	42.8	.42	3700	1500
45	47.	.45	4000	1725
50	51.5	.48		1840
55	56.	.5		2120
60	61.5	.51		2480
65	67.	.53		2625
70	75.	.55		2920
75	80.	.57		3600

Made by Hammond

Patterns for Shaum & Recorder
bases said to be at Reuther Bros
Mr Reeser Mr Mudd knows them.

Size of master pound cans
6 1/8" diam x 9 1/2" high over all

Test of House Lighting Type Motor

Test No. 1

Volts	Amps.	Speed	Weight - 6 arm	H.P.	Efficiency
43	1.1	500	3 1/4 oz	.01	16%
43	.9	1000	2 1/2 "	.015	30%
43	.8	1500	1 3/4 "	.016	35%
43	.7	2000	1 1/2 "	.018	44%
43	.6	2500	1 "	.015	43%
43	.5	3000	3/4 "	.013	45%
	Test # 2				
43	1.2	250	3 1/2 oz	.004	5.7%
43	1.1	500	3	.009	14%
43	.95	1000	2 1/4 "	.013	24%
43	.8	1500	1 3/4 "	.016	35%
43	.7	2000	1 1/4 "	.018	44%
43	.6	2500	1 "	.015	43%
43	.5	3000	3/4 "	.013	45%
43	.4	3500	1/4 "	.005	21%

Test of House Lighting
Type Motor
Test # 3.

Volts	Amps.	Speed	Weight-6" arm	H.P.	Efficiency.
42	1.2	250	3.25 oz		
42	1.1	500	2.75"		
42	.95	1000	2.25"		
42	.82	1500	1.75"		
42	.68	2000	1.25"		
42	.55	2500	.75"		
42	.6(?)	3000	.5"		
Test					

Test of Business Phonograph
D-C Old style

Speed	Volts	Amps.	Wgt-6" arm	H.P.	Efficiency
250	36.5	1.4	3.25 oz	.004	6%
500	36.5	1.3	2.75 "	.008	13%
1000	36.5	1.1	2.25 "	.013	24%
1500	36.5	1.	1.75 "	.015	31%
2000	36.5	.85	1.25 "	.015	36%
2500	36.5	.70	.75 "	.011	33%
3000	36.5	.60	.50 "	.009	30%
3500	36.5	.55	.25 "	.005	17%
	Test	#	2.		
250	43	1.8	4.25	.005	5%
500	43	1.6	3.75	.011	12%
1000	43	1.4	3.00	.018	22%
1500	43	1.2	2.25	.02	29%
2000	43	1.1	1.75	.021	33%
2500	43	1.	1.25	.018	31%
3000	43	.9	.75	.013	25%

Speeds of 12 volt motors ordered from Electrical Dept. for Brook Studio.

Business Phonograph D.C. motor, old style, ordered for Amplifier:

10 volts	550	R.P.M.
11 "	625	"
12 "	695	"
13 "	825	"
14 "	925	"

New Style enclosed phasing machine motor, as proposed for Kinetophones:

10 volts	- 1100	R.P.M
11 "	- 1300	"
12 "	- 1375	"
13 "	- 1460	"
14 "	- 1550	"

Test of 18 volt Motor, rewound
Business Phonograph. Geo Stylo

Running free.	Gourned.
Volts 12	Volts 11.6
Amp 5	Amp 5.4
Speed 1820 R.P.M.	Speed 1500.

This motor is wound with #20 wire on armature and #18 on fields. It gives sufficient speed and power on 6 volts for running the amplifier with countershaft.

Motor wound with 22-24 wire on armature and 20-22 on fields will do the work on 12 volts.